Space Weather Forecast

Issued on Monday 4 November 2024 at 13:08 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High solar activity with Moderate flares expected, and a slight chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity was moderate to high with multiple Moderate flares, the largest of which from a developing region in the southeast. There are twelve active regions, including one as yet unnumbered region. The spot mentioned above has become larger and more complex in recent hours and has been responsible for the majority of the moderate flares, with a region around the south-centre disc also showing some complexity. Numerous spots are set to rotate off the western limb in coming days with several also rotating over the eastern limb which will have to be further analysed as they rotate further onto the disc. The other spots on the disc have remained fairly stable, or are showing signs of decline.

No Earth-directed CMEs (coronal mass ejections) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds have been at slightly elevated levels. The Interplanetary Magnetic Field (IMF), Bt, was predominantly weak throughout. The north-south component, Bz, was weakly positive (northward directed) until 03/1745UTC, from at which point it became weakly negative (southward directed). Geomagnetic activity was mainly Quiet to Unsettled (Kp1-3), but became Active (Kp4) between 03/2100-04/0300UTC, with a G1/Minor Geomagnetic Storm (Kp5) interval between 04/0300-0600UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained below S1 Minor Radiation Storm levels, continuing to slowly ease through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity is expected to continue with occasional Moderate flares expected and a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: Ongoing fast winds from two coronal holes will likely see weak enhancement through Days 1-2 (04-05 Nov). Generally Quiet to Unsettled geomagnetic activity is expected initially, with a chance of Active and a slight chance of G1/Minor Geomagnetic Storm intervals. Activity then expected to decline to Quiet by Day 3 (06 Nov), although confidence in this is lower than usual.

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Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is now below the S1 Moderate Radiation Storm level, and continuing to slowly decline. However, any further notable flares bring a persistent chance for further enhancement during the period.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	Yes	20	10	5	1
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	Yes	80	80	80	80
Very Active	**R3-R5 (X Class)**	No	20	20	20	20

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	25	25	20	20
Very Active	**≥ S3 ***	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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